#### THE MINERAL INDUSTRY OF

## **COLOMBIA**

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Although its mineral sector was relatively modest by world standards, Colombia's mineral production was significant to its gross domestic product (GDP), which grew by 3.2% in 1997. A part of this increase came from a 4.4% growth in the mining and hydrocarbons sector.1 In 1998, however, Colombia ended the year in recession with only 0.2% growth in GDP, down about 5% from the year before, the result of low world oil prices, diminished demand for exports, terrorist activity, and a decline in the investment stream. The 1998 GDP was about \$255 billion in terms of purchasing power parity, or \$6,600 per capita. Colombia has had positive growth of its GDP for more than six decades and was the only Latin American country not to default on or restructure its foreign debt during the 1980's, probably owing in no small part to the conservative monetary policy conducted by an independent central bank. Inflation has declined steadily during the 1990's, declining to about 16% in 1997, but fears that it would turn around and climb to around 20% by the end of 1998 were not realized. Efforts to foster an expanded mineral sector were hindered by continuing terrorist activity, including destruction of oil pipelines and attacks on mines, petroleum production facilities, and personnel. A major problem hindering development of Colombia's mineral industry is the lack of infrastructure.

Total foreign direct investment in Colombia had climbed sharply, starting at about \$500 million in 1990 and reaching about \$5.6 billion in 1997, of which about \$1.7 billion was directed to petroleum and mining. In 1998, however, foreign investment was down rather sharply to about \$3.2 billion (The World Bank Group, [undated], Development data—Country data—Colombia, accessed November 3, 1999, URL http://www.worldbank.org. Public and private investment continued in national infrastructure, especially in energy, telecommunications, and transportation. Privatization continued, in descending order of revenues received, in electric power, mining, natural gas, and telecommunications. In spite of its problems, Colombia has had investment-grade ratings from major U.S. ratings agencies for its debt (Wall Street Journal, 1997). Whether these ratings could survive guerrilla violence and low oil prices remained a challenge.

#### **Government Policies and Programs**

The principles of "private property and initiative" are the

foundation of the economic system of Colombia. The constitution guarantees that investment of foreign capital shall have the same treatment that citizen investors have. The constitution grants the State ownership of the subsoil and nonrenewable resources with the obligation to preserve natural resources and protect the environment. The State performs supervision and planning functions and receives a royalty as economic compensation for the exhaustion of nonrenewable resources. The State believes in privatization as a matter of principle. The Colombian constitution permits the expropriation of assets without indemnification.

The mining code (Decree 2655 of 1988) covers the prospecting, exploration, exploitation, development, beneficiation, transformation, transport, and marketing of minerals. Under the law, the Ministry of Mines and Energy grants permission to explore, exploit, and develop mineral resources through the appropriate title or right. Foreign investment is dictated by law 9 of 1991, which covers the issue of equal treatment for foreign and domestic investors with access to all sectors except those considered to be vital to national security, defense, and toxic waste disposal; addresses the foreign exchange statute, which allows free remittance of profit and capital, protection of investors from adverse changes in exchange guarantees, except temporarily when Colombia's international reserves are less than 3 months of imports; and grants the responsibility of foreign investment to the Consejo Nacional de Politica Economica y Social. In 1998, the Government of Colombia continued to publicize its interest in encouraging foreign investment in the mining sector and in reducing its own role as a producer of minerals.

The current (1998) tax structure (law 223 of 1995) includes national levies of a 35% income tax; a 35% capital gains tax; a 7% remittance tax on dividends sent outside the country; a 16% value-added tax; and a 1% one-time-only stamp tax at the time the mining contract is ratified. Municipal levies include a 0.2% to 0.7% industry tax and/or a 0.2% to 1.0% trade tax, as well as a property tax ranging between 0.1% and 0.16% depending upon the locality. According to law 141 of 1994. royalties on mined coal are 10% on 3 million tons per year (Mt/yr) or more, and 5% on less than 3 Mt/yr. Other royalties are 8% on nickel; 6% on alluvial gold; 5% on copper, iron ore, and platinum; 4% on lode gold and silver; and 1.5% on emeralds. Exemptions from customs duties are granted on machinery, technical equipment, their fittings, and materials and spare parts required for mineral exploration, including oil and gas.

<sup>&</sup>lt;sup>1</sup>Any datum or statistic in this text not referenced elsewhere may be assumed to be from "Country Presentation—Colombia," delivered by Dr. Orlando Cabrales Martinez, Minister of Mines, Colombia, at the Global Mining Opportunities Symposium, Palais des Congres de Montreal, Quebec, Canada, May 4-6, 1998.

#### **Environmental Issues**

The Colombian Constitution expresses a fundamental interest in sustainable growth with preservation and restoration of the environment. All economic activity is subject to environmental norms. Any activity may be closed down and prohibited if it cannot justify the damage it does to the environment. Procedures are being stabilized and streamlined so that the Ministry of Mines and Energy can supervise mines for compliance with environmental regulations and for any possible sanctions defaults.

Emission and effluent standards have been adopted, and community consultation is an obligation of a mining project before the commencement of operations. Penalties for air pollution are set forth in law 948 of 1995; fees for direct and indirect point-source discharges, and fees for biological oxygen demand (BOD) and total suspended solids (TSS) discharges are described in Decree 901 of 1997 and Resolution 0273 of 1997. These point source discharge, BOD and TSS fees are perhaps better described as fines imposed automatically upon determination of liability. Tax incentives are offered for buying equipment for environmental protection (law 223 of 1995, Article 4). A mine closure reclamation bond is needed in the form of an insurance policy or bank warranty for rehabilitation and reclamation of disturbed areas, as set forth in law 99 of 1993, Article 60, and Decree 1753 of 1994, Article 4.

#### **Production**

Coal, nickel, and petroleum are the most important minerals to the Colombian economy. According to data received by the U.S. Geological Survey through country questionnaires, other official sources, or estimates, Colombia was projected to rank 10th in the mine production of nickel in 1998, and although its ranking in coal and petroleum were lower, the contribution of those commodities to the economy is significant in terms of foreign-exchange earnings.

Colombia is also well known as a leading producer of emeralds and, in the past, has been an important producer of gold. Although the country's production of gold has fluctuated conspicuously, it continues to be an important source of Government revenue. With less than one-tenth of 1% of total output in 1998, Colombia ranked about 16th in world mine production of gold, and was roughly tied with Argentina as the 5th largest producer of gold in Latin America after Peru, Brazil, Chile, and Mexico. In addition, Colombia produced a number of other mineral commodities and products in modest amounts, including copper, iron ore, lead, manganese. platinum, and zinc, and a number of industrial minerals, including cement; in 1998, Colombia and Brazil were the sole producers of platinum in Latin America. Colombia was the fifth leading producer of crude petroleum in the region, after Venezuela, Mexico, Brazil, and Argentina.

Mineral production during the year included gains for the fuel minerals; crude oil increased steeply to new highs; coal climbed slightly but also to new highs. Among the metals, output of nickel and silver increased conspicuously, but

production of copper and iron ore dropped sharply. Gold, lead, platinum, and zinc were essentially unchanged. Among the more important industrial minerals, cement output increased from that of 1997 and the production of emeralds climbed sharply to new highs.

#### Trade

Colombia's value of exports totaled about \$11.3 billion in 1998. Crude petroleum and petroleum products accounted for almost 27% of all exports, or about \$2.80 billion. Coal exports accounted for 10% of the value of total exports, or about \$1 billion. Colombia's value of imports was \$14.4 billion. The United States continued to be Colombia's main trading partner, taking 38% of Colombia's exports and providing 42% of its imports. Total trade between the two countries was approaching \$10 billion (U.S. Central Intelligence Agency, 1999, World Factbook Colombia, accessed September 30, 1999, at URL http://www.odci.gov/cia/publications/factbook/co.html).

Mining export data for 1997 (the latest available) show, in descending order of value, coal valued at \$945 million; ferronickel, at \$193 million; emeralds, at \$129 million; gold, at \$84 million; cement and clinker, at \$69 million; platinum, at \$3 million; and silver, at \$438,000. Although these are only the principal mineral exports, their total value is about \$1.422 billion. Petroleum export data were not available.

#### **Structure of the Mineral Industry**

Although privatization was being emphasized by the Government, ownership of the mineral industry in Colombia was, nonetheless, mixed. The Government participated directly in the production of minerals through several companies associated with the Ministry of Mines and Energy. The Government company, Minerales de Colombia S.A., managed, developed, and promoted the exploitation of minerals except coal, petroleum, and radioactive minerals (INGEOMINAS-UPME, 1996, p. 12). The Empresa Colombiana de Carbon Ltda., another Government-owned company under the Ministry of Mines and Energy, had the responsibility to manage the country's coal resources and to promote coal production (INGEOMINAS-UPME, 1996, p. 13). The Empresa Colombiana de Petróleos S.A. (ECOPETROL) negotiated all petroleum contracts with the private sector on behalf of the Government. It participated in the production of petroleum and natural gas directly and in association with the private sector.

#### **Commodity Review**

#### Metals

**Copper.**—Colombia's copper production has been uneven since 1990. Output grew slowly until 1993, then became nonexistent. Since then, output has continued at a lesser rate than between 1990 and 1992. Production during 1998 dropped by about 22% from that of 1997, and future output of copper seems somewhat unpredictable.

There are several porphyry copper deposits, consistent with porphyry-type mineralization elsewhere in the Cordillera of northern and southern Colombia. In the past, some copper had been mined at El Roble gold mines, southwest of Medellin. In 1990, El Roble Exploracion y Explotacion S.A. began operations at a new copper mine northwest of Medellin from which concentrates were shipped to Hibi Kyodo Smelting Co. Ltd. in Japan. More recently, Cobres de Colombia S.A. operated copper smelting and refining facilities at Cali. Other copper porphyry deposits are at Acandi, El Dovio, Mocoa, Murindo, and Pantanos. Murindo has been considered to be a good future mining target because of its attractively high gold content.

Gold.—Production of gold, totaling 18.8 metric tons (t) was about the same as that of 1997. Between 10% and 20% of total output was by large mining companies; the remainder was produced by small- and medium-sized companies, as well as individuals. Gold mining in Colombia dates back to pre-Columbian times. As is true elsewhere in Latin America, inherited but primitive methods of treating placer (alluvial) ores result in significant loss, estimated to be as much as 60%. The largest present producer, Mineros de Antioquia S.A., extracted gold from placer deposits in the Nechi River and its affluent, the Tigui River. The company's production was exported mainly to North Korea, Switzerland, and the United States (Minas Hoy, 1995).

Nickel.—Mine production of nickel from Cerro Matoso S.A. (CMSA), the only nickel producer in Colombia, was 29,422 t, down by about 6% from that of 1997. Production of ferronickel was 28,140 t, up by about 12% from that of 1997. Most of Colombia's nickel reserves were being exploited by CMSA at a large open pit mine in Cordoba Department in northern Colombia, formerly a joint venture between the Colombian Government and GENCOR Ltd. of South Africa. The majority owner, GENCOR, acquired the shares owned by the Government during the latter's privatization program and transferred ownership to its newly constituted subsidiary, Billiton PLC of the United Kingdom (Mining Journal, 1997b). Following this, Billiton acquired Australia's QNI Ltd., awarding its interest in Cerro Matoso to management by QNI. An interesting statistic is that for the 12 months ending June 30, 1996, run-of-mine production averaged 2.9% nickel, one of the highest lateritic nickel ore grades in the world (GENCOR Ltd., 1996, p. 35).

**Platinum.**—Colombian production of platinum in 1998 was 437 kilograms (kg), an increase of about 7% from that of 1997. Although Colombia produced less than 1% of the total platinum, it ranked 6th among the 10 world producers. The leading producing Departments were Antioquia and Choco; smaller quantities were produced in the Departments of Bolivar, Cauca, Cordoba, Narino, and Valle; the Choco Department has been producing platinum since the 16th century (Loebenstein, 1985). Colombia was the only producer of platinum until the beginning of the 20th century (Garces

Gonzalez, 1995, p. 276). All platinum production in Colombia is from placer deposits which are, in some places, associated with the production of gold.

**Silver.**—Although Colombian production of silver has been somewhat erratic during the past 5 years, output in 1998 jumped about 48% to a total of 5,218 kg versus the year before. Silver is known to occur with gold in epithermal veins in the Canon del Cauca in the Departments of Antioquia, Caldas, and Risalda; this is an old district that has been exploited since the Spanish Crown owned Colombia. Silver is also associated with gold and manganese in volcanigenic massive sulfide deposits in the so-called Canas Gordas Terrain of the Cordillera Occidental.

#### **Industrial Minerals**

Emerald production totaled about 9,360,000 carats, an increase of about 40% compared with that of 1997. Emerald mining goes back to pre-Columbian times in Colombia, and many individual prospectors today (1998) work over the waste heaps of larger mines and otherwise hunt for these gemstones. The main emerald producers in Colombia were Tecnicas Minerals Ltda., Compania Colombiana de Explotaciones Mineras, Sociedad de Esmeraldas y Minas S.A., and Compania Esmeraldas de Chivor S.A. These companies were essentially contractors to MINERALCO S.A., the Colombian State agency with managerial responsibility for the promotion, development, and industrialization of the country's mines, particularly emeralds and gold.

The production center best known for the quality of its emeralds was Muzo-Quipama in the Department of Boyaca. Other deposits were also exploited in the municipalities of Chivor, Coscuez, and Penas Blancas also in Boyaca, and in Ubala, Gachala, and Yacopi in the Department of Cundinamarca (INGEOMINAS-UPME, 1996, p. 28).

#### Mineral Fuels

Coal.—Output of coal reached new highs during the year, climbing a little more than 3% above that of 1997. Colombian coal deposits were the largest in Latin America, with proven reserves of 6.5 billion metric tons. The principal coalproducing regions were in the Departments of, La Cesar and Guajira together yielding four-fifths of the country's output. Physically, the coal sector was divided into two main areas—the highly modernized open pit mines (steam coal) of La Cesar and Guaiira in which large investment in equipment and technology have been made, and the more traditional underground mines (coking and steam coals) of the Andean Mountains in the Departments of Antioquia, Boyaca, Cundinamarca, and Valle del Cauca. The Cerrejon Norte Mine in La Guajira was the largest producer, with an output approaching 15 million metric tons (Mt), or nearly one-half of the country's production. The mine was a joint venture between Carbones de Colombia S.A. and Exxon Corp. through its subsidiary, International Colombian Resources Corp.

(INTERCOR). In 1993, the Government created a new state-owned company, Empresa Colombiana de Carbon Ltda. (ECOCARBON), to manage and regulate the country's coal resources. ECOCARBON grants coal-mining licenses or association contracts to private companies and to individuals intending to explore for and exploit coal in Colombia (Colombian Government Trade Bureau, [no date], Energy and mining, accessed August 24, 1998, at URL http:www.access. digex.net/~coltrade/31.htm).

The Government continued with its plans to privatize its 50% interest in Cerrejon Norte despite the 1997 dynamiting by the Cuban-inspired National Liberation Army of a 490-foot section of the rail tracks over which coal was shipped for export. The terrorist group registered its evident opposition to INTERCOR and the Government (Exxon Corp.'s INTERCOR, September 29, 1997, Exxon unit's Colombia coal exports halted, accessed September 30, 1997, at URL http://biz.yahoo.com/finance/97/09/29/XON\_y0021\_1.html). Exxon, through INTERCOR, negotiated a 25-year extension on its development contract on Cerrejon Norte, previously scheduled to end in 2009, now good through 2034 (Financial Times, 1999).

Two other important coal properties in northern Colombia have been combined. Cerrejon Centro, previously owned by the Swiss trading company, Glencore (50%), and Amcoal/Minorco (50%), was combined with Rio Tinto plc.'s Oreganal property into a single venture owned by Rio Tinto, Glencore, and Minorco/Amcoal in shares of one-third each (Mining Journal, 1997a). This same consortium then acquired the contract from ECOCARBON to develop the Cerrejon Sud property adjoining the Cerrejon Centro and the Oreganal tracts.

Colombia's consumption of coal was modest; a large proportion of its output was exported, averaging more then 80% of total production. Of this, about 60% was from the Cerrejon Norte Mine. Europe was the main purchaser of Colombian coal, receiving about 82% of the 29.6 Mt of coal exported by Colombia in 1998; United States received about 16.5% of Colombian coal exports; Latin America and the Far East received the remainder.

Natural Gas and Crude Petroleum.—Production of natural gas was steady from 1997 through 1998, remaining at the 13-billion-cubic-meter level. Marketed gas declined about 10% to 5.4 billion during the year. Output of natural gas was up sharply, about 38%, in 1997 compared with that of 1996. Gas production in Colombia is from associated and, in some cases, large nonassociated reservoirs. The large difference between marketed and produced gas probably reflects the faster growth of production compared with domestic distribution facilities.

Compared with that of 1997, production of crude oil jumped 14% to 273 million barrels, a new record for Colombia. This represented a 64% increase in crude output in the 5 years since 1994. The Government-owned company, ECOPETROL, was responsible for the exploration and production of natural gas and petroleum crude in Colombia. ECOPETROL explored and produced natural gas and petroleum independently, as well as in association with the private sector. In addition, a small

percentage of hydrocarbons was produced by the private sector in concessions awarded by the Government.

Events during the year continued to be unsettling for the petroleum industry. Equipment was sabotaged, employees were abducted and held hostage, pipelines were repeatedly dynamited, and production suffered. Contractual problems became acute in terms of the division of revenues and the deadlines for declaring exploration blocks feasible for commercial production to avoid losing production rights. A complication was that Colombia's arrangements with private companies involved "... some of the least competitive oil contracts in the world" (Financial Times, 1997b, p. 4). Reportedly, the Government "take" averaged about 85% of every barrel produced; by contrast, in Britain, it was about 35%.

During 1998, some technological good news arose from the oilfields of Colombia—several new exploratory wells were drilled out horizontally in the producing zones by using underbalanced downhole mud pressures and extended lateral reach. Harken de Colombia Ltd. drilled two exploratory wells in the Middle Magdalena Valley where results were quite promising, with good initial production values and high calculated deliverabilities (World Oil, 1998). Many more such wells will probably be drilled in months to come.

#### **Infrastructure**

Colombia had 115,564 kilometers (km) of highways, of which 13,868 km are paved. The country had 14,300 km of waterways navigable by river boats. There were a total of 3,386 km of railway, of which 150 km were standard gauge and carried coal from the Cerrejon mines to the marine port of Bahia Portete. Narrow-gauge railways totaled 3,236 km, of which about 1,830 km are in use. Colombia had 89 airports with paved runways—2 were longer than 3,047 meters (m), 9 were between 2,438 and 3,047 m long, 36 were between 1,524 and 2,438 m long, 35 were between 914 and 1,524 m long, and 7 were less than 914 m long.

Pipeline lengths totaled 3,585 km for crude oil, 1,350 km for petroleum products, 830 km for natural gas, and 125 km for natural gas liquids. Of Colombia's nine ports, the main ones were in Barranquilla, Buenaventura, Cartagena, and Santa Marta. (Central Intelligence Agency, 1997, Colombia, World Factbook, accessed September 29, 1997, at URL http://www.odci.gov/cia/publications/factbook/country-frame.htm). Near yearend, the Government solicited bids on renovating a stretch of railway connecting the capital, Bogota, with the Caribbean port of Santa Marta (Financial Times, 1997a).

#### Outlook

Resolution of Colombia's continuing problems with terrorist groups will help realize the promise of its extensive mineral resources, along with continued development of its infrastructure, coping successfully with the (terrorist) activities aimed at destroying this infrastructure. Continuation of its privatization program will attract new investment. Coal and

petroleum will probably play a major role in the creation of future wealth in this well-endowed country.

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#### **Major Sources of Information**

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## TABLE 1 COLOMBIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity METALS	1994	1995	1996	1997 e/	1998 e/
Bauxite e/	1,700	1,700	1,700	1,700	1,700
Copper, mine output, Cu content	2,600 r/	2,800 r/	2,200 r/	1,700 1,800 r/ 2/	1,700
Gold kilograms	20,762	21,136 r/	22,073	18.811 r/ 2/	18,810 2/
Iron and steel:	20,702	21,130 1/	22,073	10,011 1/ 2/	10,010 2/
Iron ore and concentrate thousand tons	610	734	606 r/	755 r/ 2/	526 2/
			274		
Pig iron do.	244	282		322 2/	195
Steel, crude do.	693	714	677	710	700
Semimanufactures, hot-rolled do.	642	692	650 e/	650	650
Lead:	•••			***	***
Mine output, Pb content	290	300 e/	300 e/	300	300
Refined (secondary)	3,500 e/	8,000 r/ 2/	10,000 r/ 2/	10,000 r/ 2/	12,000 2/
Manganese, mine output, Mn content	220	1,000	1,000 e/	1,000	1,000
Nickel:					
Mine output, Ni content	26,141	24,194	27,700	31,230 2/	29,422 2/
Ferronickel, Ni content	20,833	24,565	22,934	25,171 2/	28,140 2/
Platinum-group metals kilograms	1,084	973	672	409 2/	437 2/
Silver do.	5,899	5,886 r/	6,407	3,515 r/ 2/	5,218 2/
Zinc, mine output, Zn content	r/	r/	r/	57 r/ 2/	2/
INDUSTRIAL MINERALS					
Asbestos, mine output	128,800 r/	122,717	137,277	136,700 2/	136,000
Barite	7,000	21,300	6,800	6,000 2/	6,000
Cement, hydraulic thousand tons	9,322	9,407	8,907 r/	8.446 r/	9,190 2/
Clays:	7,522	5,107	0,707 17	0,110 1/	J,170 Z
Bentonite	1,018	9,000	9,000 e/	8,640	8,500
Common clay and kaolin thousand tons	6,700	7,300	3,957	8,040 2/	8,000
Diatomite e/	4,000	4,000	4,000	4000	4,000
	,	*	*		*
Feldspar	76,188	58,100	78,093	66,845 2/	65,000
Fluorite	800	720	700 r/	802	800
Gemstones, emerald 3/ thousand carats	7,202	6,306	7,151	6,688 2/	9,360 2/
Gypsum thousand tons	450	450 e/	522	565	560
Lime, hydrated and quicklime e/ do.	1,300	1,300	1,300	1,300	1,300
Magnesite	10,747	17,474 r/	12,634 r/	10,500	10,500
Mica e/	55	55	55	55	55
Nitrogen, N content of ammonia e/	111,600	98,900	101,500 2/	80,900 2/	83,000
Phosphate rock	48,107	48,100 r/	40,484	44,517 2/	50,000
Salt:					
Rock thousand tons	94 r/	103 r/	153 2/	141 r/ 2/	165 2/
Marine do.	116 r/	132 r/	424 2/	232 r/ 2/	330 2/
Total do.	210 r/	235 r/	577 r/	373 r/	495
Sodium compounds, n.e.s., sodium carbonate e/	121,000	121,000	121,000	125,000	125,000
Stone and sand:					
Calcite e/	6,500	6,500	6,500	6,500	6,500
Dolomite e/ thousand tons	45	45	45	45	45
Limestone do.	14,000	19,248	14,151	13,392 2/	15,000
Marble e/	75,000	130,000	170,000	191,250 2/	190,000
Sand excluding metal-bearing e/	850,000	900.000	900,000	900,000	925,000
Sulfur:			,	,	, ==,,,,,,
Native, from ore	53,357	60,000	49,425	53,541 2/	48,000
Byproduct, from petroleum e/	12,200	15,000	16,000 2/	14,872 r/	15,000
Total	65,557	75,000	65,425	68,413 r/ 2/	63,000
				*	
Talc, soapstone, pyrophyllite	18,000	19,248	14,800 e/	14,832 2/	15,000
MINERAL FUELS AND RELATED MATERIALS	24.000	24.000	24.000	24.000	24.000.24
Carbon black e/	24,000	24,000	24,000	24,000	24,000 2/
Coal thousand tons	22,665	25,869 r/	29,564 r/	32,742 r/ 2/	33,751 2/
Coke, all types do.	562	600 e/	600 e/	610	615
Gas, natural:					
Gross million cubic meters	5,423	7,674	9,424	13,019 2/	13,000
Marketed do.	4,430	5,000 e/	5,200 e/	5,905 2/	5,347 2/
Natural gas liquids e/ thousand 42-gallon barrels	2,500	2,500	2,500	2,600	2,600

See footnotes at end of table.

#### TABLE 1--Continued COLOMBIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1994	1995	1.996	1997 e/	1998 e/	
MINERAL FUELS AND RELATED MATERI			, , , ,			
Petroleum:						
Crude thous	and 42-gallon barrels	166,096	213,397	228,771 r/	238,156 r/ 2/	272,620
Refinery products:						
Liquefied petroleum gas	do.	6,203	7,010	7,955	7,881 2/	7,491 2/
Gasoline:	_					
Aviation	do.	182	250	136	142 2/	145 2/
Motor	do.	30,072	26,459	38,320	37,920 2/	38,371 2/
Jet fuel	do.	5,328	5,662	6,036	5,792 2/	6,188 2/
Kerosene	do.	1,437	1,342	1,523	1,180 2/	1,025 2/
Medium distillate fuel oil	do.	20,612	21,969	24,518	24,265 r/ 2/	23,209 2/
Lubricants	do.	372	372	400 e/	442 r/ 2/	431 2/
Residual fuel oil (Black oil)	do.	19,886	20,039	19,361	19,730 2/	18,759 2/
Asphalt and bitumen	do.	2,865	2,964	2,995 r/	3,077 r/ 2/	2,081 2/
Refinery fuel and losses and unspecified produ	icts e/ do.	3,017	7,476	15,000	15,000	4,375 2/
Total	do.	89,974	93,543	116,240 r/e/	115,429 r/	102,075

e/ Estimated. r/ Revised. 1/ Includes data available through October 1, 1999.

<sup>2/</sup> Reported figure.

<sup>3/</sup> Based on registered exports by the Banco de la República.

# ${\it TABLE~2} \\ {\it COLOMBIA:~STRUCTURE~OF~THE~MINERAL~INDUSTRY~IN~1998} \\$

(Thousand metric tons unless otherwise specified)

Co	ommodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Carbon black		Cabot Colombiana S.A. (private, 100%)	Cartagena, Bolivar Department (plant)	NA
Do.		Productos Petroquimicos S.A. (private, 100%)	Cali, Valle del Cauca Department (two plants)	12
Cement		Cia. Colombia de Clinker S.A. (Colclinker) (private, 100%)	Cartagena, Bolivar Department (plant)	1,100
Do.		Cementos del Caribe S.A. (private, 100%)	Barranquilla, Atlantico Department	1,000
		Cementos del Valle S.A. (private, 100%)	Yumbo, Valle del Cauca Department	1,200
		Cementos Rio Claro S.A. (private, 100%)	Puerto Trifuno, Antioquia Department	1,000
Coal		Carbones de Colombia S.A.	El Cerrejon Norte Mine, La Guajira	15,000
Com		[CARBOCOL (Government) 50%] and International Colombia Resources Corp. [INTERCOR (Exxon) 50%]	Department Department	13,000
Do.		Rio Tinto (1/3); Minorco/Amcoal (1/3); Glencore (1/3)	Cerrejon Centro mines, Cerrojon Sud mines, and Oreganal mines, La Guajira Department	NA
Do.		Drummond, Ltd. (Drummond Co., 100%)	Drummond Mine, Cesar Department	4,000
Do.		Prodeco (private, 100%)	Calenturitas in Cesar Department	2600
Do.		Acerias Paz del Rio S.A. (private, 100%)	Paz del Rio, Boyaca Department (mine)	600
Copper		El Roble Exploracion y Explotacion S.A. (Minas El Roble, 51%; Nittetsu Mining, 44.1%; and C Itoh, 4.9%)	El Roble Mine, El Carmen, Choco Department	4
Emerald		Minerales de Colombia S.A. (MINERALCO) (Government, 100%)	Chivor, Coscuez, Muzo, and Quipama Mines, Boyaca Department	NA
Gold	kilograms	Frontino Gold Mines Ltd. (private, 100%)	El Silencio Mine, Segovia, Antioquia Department	1,500
	do.	Fisher-Watt Gold Co. (private, 100%)	Oronorte Mine, Segovia, Antioquia Department	500
Do.	do.	Mineros de Antioquia S.A. (private, 100%)	Rio Nechi, near El Bagre, Antioquia Department (mines)	2,000
Do.	do.	Small miners (cooperatives and individual prospectors)	Rio Nechi, Antioquia Department (mines)	NA
Iron ore		Acerias Paz del Rio S.A.	Paz del Rio, Boyaca Department (mine)	800
Kaolin		Ceramicas del Valle Ltda., (private, 100%)	Yumbo, Valle del Cauca Department (mine)	NA
Natural gas	million cubic meters	Empresa Colombiana de Petroleos S.A. (ECOPETROL) (Government, 100%)	North coast, La Guajira Department (national gasfields)	3,500
Do.	do.	International Petroleum Colombia, Ltd. (International Petroleum Corp., 100%)	Barrancabermeja locale, Antioquia and Santander Departments	1,200
Nickel		Cerro Matoso S.A. (QNI Ltd. 100%: latter owned by Billiton PLC 100%).	Cerro Matoso Mine, Montelibano, Cordoba Department	32
Nitrogen		Abonos de Colombia (private, 100%)	Cartagena, Bolivar Department (plant)	100
Do.		Monomeros Colombo-Venezolanos S.A. (private, 100%)	Barranquilla, Atlantico Department (plant)	85
Petroleum	thousand 42-gallon barrels	ECOPETROL	16 fields in various Departments	70,000
Do.	do.	Houston Oil Colombiana S.A. (HOCOL) (Royal Dutch Shell, 100%)	14 fields in various Departments	36,500
Petroleum products	do.	ECOPETROL	Barrancabermeja Refinery, Santander Department	71,400
Do.	do.	do.	Cartegena Refinery, Bolivar Department	25,806
Do.	do.	do.	Tibu, Norte de Santander Department	1,825
Do.	do.	do.	Orito, Putumayo Department	875
Phosphate		Fosfatos de Colombia S.A. (private, 100%)	Neiva, Huila Department	30
Do.		Fosfatos Boyaca, S.A (Government, 100%)	Iza, Boyaca Department	20
Platinum		Small miners (cooperatives and individual prospectors)	Rio San Juan, Choco Department	NA
C 1, .	<del></del>	Instituto de Fomento Industrial (IFI)	Manaure Salina, La Guajira Department	700
Salt, marine		(Government, 100%)		

## TABLE 2--Continued COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

#### (Thousand metric tons unless otherwise specified)

		Major operating companies	Location of	Annual
Commodity		and major equity owners	main facilities	capacity
Silver	kilograms	Frontino Gold Mines Ltd. El Silencio Mine, Segovia, Antioquia		2,500
			Department	
Do.	do.	Small miners (individual prospectors and	Rio Nechi, Antioquia Department (mines)	2,000
		cooperatives)		
Steel, intergrated plant		Acerias Paz del Rio S.A.	Belencito, Boyaca Department	400
Steel, semiintergrated plants		Siderurgica del Caribe (private, 100%)	Cartagena, Bolivar Department	NA
Do.		Siderurgica del Boyaca S.A. (private, 100%)	Bogota, Federal District	NA
Do.		Siderurgica del Medellin S.A. (private, 100%)	Medellin, Antioquia Department	NA
Do.		Siderurgica del Muna S.A. (private, 100%)	Chusaca, Federal District	NA
Do.		Siderurgica del Pacifico S.A. (private, 100%)	Cali, Valle del Cauca Department	NA
Sulfur		Industrias Purace S.A. (private, 100%)	El Vinagre Mine, Cauca Department	60
Do.		ECOPETROL	Barrancabermeja, Santander Department	29
ATA AT . 11.1.1				

NA Not available.